

Data Collection and Exploration

Finding useful data before making decisions

การเก็บและสำรวจข้อมูลก่อนตัดสินใจ

Good decisions start with good data.

การตัดสินใจที่ดีเริ่มจากข้อมูลที่ดี

Unit 2 focus:



Collect data



Check data



Explore data



Find patterns



Use data to decide

From Unit 1 to Unit 2

Data Science needs good data.

วิทยาการข้อมูลต้องใช้ข้อมูลที่ดี

Unit 1:

Data Science Process



Unit 2:

Focus on the middle steps:



If the data is poor, the result will be poor.

ถ้าข้อมูลไม่ดี ผลลัพธ์ก็จะไม่ดี

Why Do We Collect Data?

Data helps us understand a problem.

ข้อมูลช่วยให้เราเข้าใจปัญหา



Answer a question

ตอบคำถาม



Understand a problem

เข้าใจปัญหา



Find patterns

หารูปแบบ



Make better decisions

ตัดสินใจได้ดีขึ้น



Example question:

Which time of day has the highest PM2.5?

Garbage In, Garbage Out

ข้อมูลไม่ดี → ผลลัพธ์ไม่ดี



wrong
numbers



ID	Name	Age	Email	Score
1	Somchai	25	somchai@example.com	85
2		-5 🚩	prayaoexample.com 🚩	120 🚩
2 🚩	Somchai	25	somchai@example.com	85
4	?	30	nuree@example 🚩	N/A 🚩
5	Niran	40	niran@example.com	*** 🚩

What Is Data?

Raw facts we can collect.

ข้อเท็จจริงดิบที่เราสามารถเก็บได้



27

hot



photo



voice recording



classroom observation

Two Main Types of Data

Numbers and descriptions

ตัวเลขและคำอธิบาย



Quantitative Data

ข้อมูลเชิงปริมาณ

Data in numbers



25

68

92

150



Qualitative Data

ข้อมูลเชิงคุณภาพ

Data in words, descriptions,
or opinions



Numbers you can count and measure

VS



Words that describe and explain

Quantitative Data

Data that can be counted or measured.

ข้อมูลที่นับหรือวัดได้



**Quantitative
data is data in
numbers.**



number of
students



temperature



PM2.5 level



electricity use



daily rainfall



screen time



Quick question: Is '5 hours of phone use' quantitative data?

Qualitative Data

Data that describes meaning or opinions.

ข้อมูลที่อธิบายความหมายหรือความคิดเห็น



Qualitative data is data in words, opinions, descriptions, or observations.



opinions



interviews



reviews



feelings



descriptions



comments



Quick question: Is 'The app is easy to use' qualitative data?

Quick Check: What Type of Data Is It?

Quantitative or Qualitative?

ข้อมูลเชิงปริมาณหรือข้อมูลเชิงคุณภาพ?



Pair Work: 2 minutes

1



1. 32°C

2



2. "The food tastes good."

3



3. 45 students

4



4. "The website is confusing."

5



5. 2 hours of screen time

6



6. Student interview answer

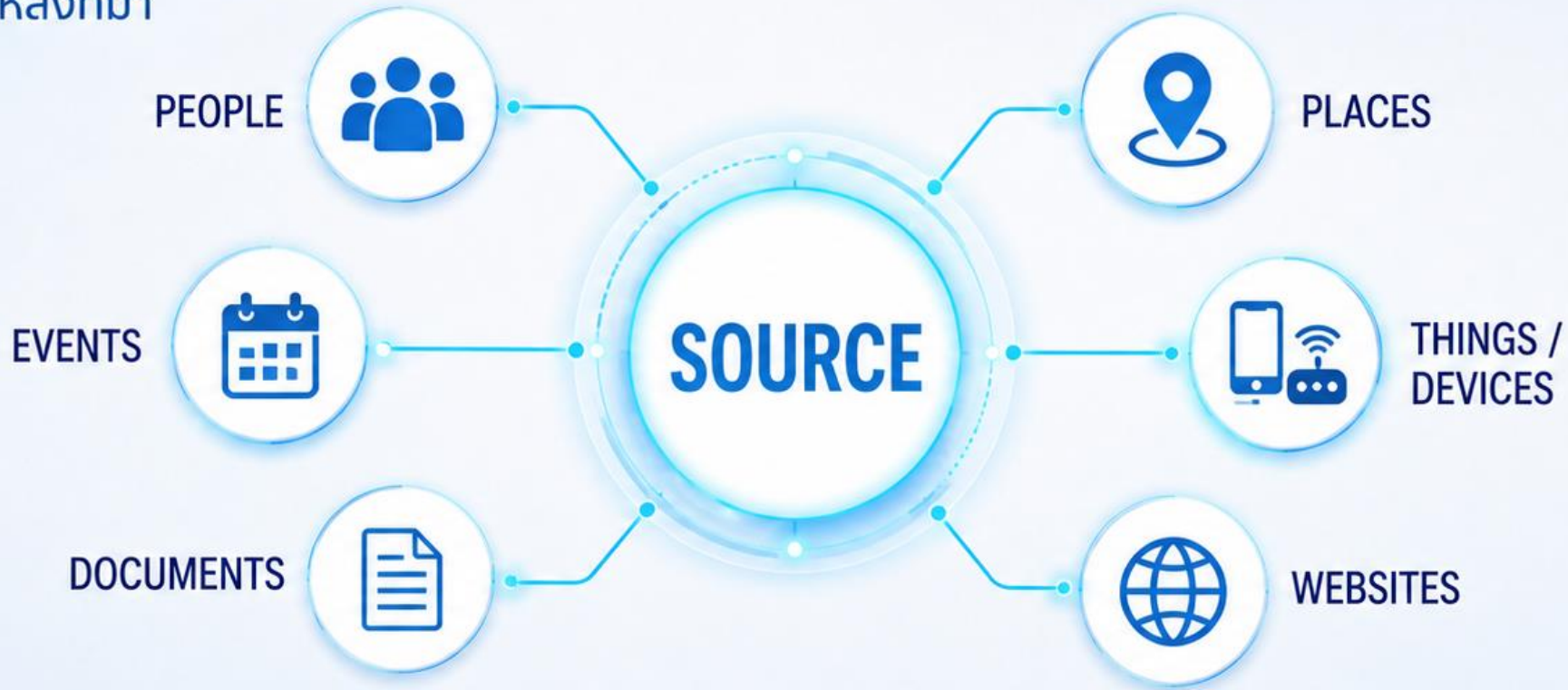


Write QN for Quantitative, QL for Qualitative.

Where Does Data Come From?

Every dataset has a source.

ข้อมูลทุกชุดมีแหล่งที่มา



Where did this data come from?

Primary Data

Data collected directly from the original source.

ข้อมูลที่เก็บโดยตรงจากแหล่งข้อมูลจริง



Primary data is
collected directly by
you or your group.



interview
students



survey
classmates



observe lunch
behavior



run an
experiment



measure classroom
temperature



Key idea: You collect it yourself.



Secondary Data

Data collected by someone else.

ข้อมูลที่ผู้อื่นเก็บไว้แล้ว



Secondary data
is data that
already exists.

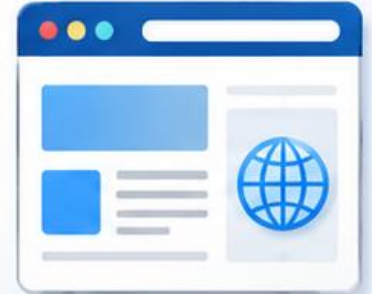
reports



articles



websites



statistics



documents



attendance records

Date	Name	Status
---	---	✓
---	---	✓
---	---	✓
---	---	✓



You use data that someone else collected.

Primary vs Secondary Data

Which one should we use?

เราควรใช้ข้อมูลแบบไหน?



Primary Data



collected directly



more current



more specific



takes more time

Secondary Data



already exists



faster to get



cheaper



may be outdated or incorrect



Choose the source that matches your goal.

เลือกแหล่งข้อมูลให้เหมาะกับเป้าหมาย



Which is better
for your project?

How Can We Collect Data?

Different questions need different methods.

คำถามต่างกัน วิธีเก็บข้อมูลก็ต่างกัน



1 Interview



2 Survey



3 Observation



4 Experiment



5 Document
Review



6 Census



Which method is best for your goal?

Interview

Ask people and listen to their answers.

ถามและฟังคำตอบจากผู้ให้ข้อมูล



- interviewer: asks questions
- interviewee: answers questions
- open-ended questions
- instant responses



Best for:

opinions, feelings, experiences



Primary or secondary data?

Survey

Collect answers from many people.
เก็บคำตอบจากคนจำนวนมาก

SURVEY

1. What is your favorite subject?

☒ Math
☐ Science
☐ English
☐ Other _____

2. How often do you study after school?

☐ Every day
☒ A few times a week
☐ Once a week
☐ Rarely

3. What do you like most about your school?

SUBMIT



a set of
written
questions



sent to
a group
of people



useful for
many
responses



good for
simple
opinions
or choices

Examples



Google Form



paper
questionnaire



class poll



Primary or secondary data?



Observation

Watch carefully and record what happens.

สังเกตและบันทึกสิ่งที่เกิดขึ้น



Observation means:

- ✓ watching behavior or events
- ✓ recording what happens
- ✓ not changing the situation



Example:

Observe students during lunch and record food choices.



Primary or secondary data?



Experiment

Test something by controlling factors.

ทดลองโดยควบคุมปัจจัยบางอย่าง

With sunlight



Without sunlight



DATA TABLE

Day	With Sunlight (cm)	Without Sunlight (cm)
1	2	2
3	6	2
5	10	3
7	14	3



Example: Plant growth with sunlight vs without sunlight



An experiment means:



test an idea



control some factors



compare results

Example:

Plant growth with sunlight vs without sunlight



?

Primary or secondary data?

Document Review and Census

Use existing records or collect from everyone.

ใช้เอกสารที่มีอยู่ หรือเก็บข้อมูลจากทุกคน



Document Review

Use information from:



reports



articles



forms



attendance records



Census

Collect information from every member of a population.



Example:
Ask every student in M5
about screen time.



Which one is usually **secondary data**?

Choose the Best Method

Match the method to the question.

เลือกวิธีให้ตรงกับคำถาม

1



“What do students think about the school website?”



2



“How many students bring water bottles?”



3



“Does sunlight affect plant growth?”



4



“What was the attendance rate last month?”



5



“How many people live in one district?”



METHOD BANK



Interview



Survey



Observation



Experiment



Document Review



Census



Pair Work: 4 minutes



Mini Activity: Plan Your Data Collection



Start with a question.

เริ่มจากคำถาม



1. What affects students' sleep time?



2. What food is most popular in the canteen?



3. How much screen time do students have?



4. What makes students spend money?

Complete:



What data do you need?



What type of data is it?



Where will it come from?



Which method will you use?



Is it primary or secondary?



Pair Work: 6 minutes



What Did We Learn Today?

Good data helps us make better decisions.

ข้อมูลที่ดีช่วยให้เราตัดสินใจได้ดีขึ้น

123
≡≡≡

Quantitative
or Qualitative



Data comes
from different
sources



Primary data
is collected
directly



Secondary data
already exists



Different
questions need
different methods



Bad data can
lead to
bad results



Question



Source



Method



Data



Explore



Decision



Exit Ticket

Before you leave...

ก่อนจบคาบเรียน...



- 1 Give one example of quantitative data.
- 2 Give one example of qualitative data.
- 3 What is the difference between primary and secondary data?
- 4 Which data collection method would you use to learn students' opinions? Why?



Good data starts with a **clear question.**

